

DISSERTATION
DEFENSE

Elliptic Curves and Moonshine

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Abstract: In this talk, I will describe the main results of my doctoral dissertation. The first main result of my thesis is a characterization of all infinite-dimensional graded modules for the Thompson group whose graded traces are certain weight $3/2$ weakly holomorphic modular forms satisfying special properties. This characterization serves as an example of moonshine for the Thompson group.

I will begin the talk by giving a brief history of moonshine, describing some of the existing examples of the phenomenon in the literature, and discussing how my work fits into the story. I will then demonstrate how we can use the aforementioned Thompson-modules to study geometric invariants (e.g., rank, p -Selmer groups, and Tate-Shafarevich groups) of certain families of elliptic curves. In particular, this serves as an example of using moonshine answer questions in number theory.

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<https://tinyurl.com/MKhaqan>

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